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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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JUN 29 1992

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the matter of

PAGING NETWORK, INC.

Request for a Pioneer's
Preference for Pioneering
the Ability for Spectrally
Efficient, Cost Effective
One-Way Mobile Voice
Communications in the
930-931 MHz Band

ET Docket No. 92-100

File No. PP-84

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FILE

To: The Commission

REPLY COMMENTS OF MINILEC SERVICE, INC.

Martin A. Schwartz
President
Richard J. Helferich
Vice President
MINILEC SERVICE, INC.
9321 Eton Avenue
Chatsworth, CA 91311
Telephone: (818) 998-0826

Kenneth E. Hardman, P.C.
Attorney At Law
1255 - 23rd Street, N.W.
Suite 800
Washington, D.C. 20037
Telephone: (202) 223-3772
Its Attorney

June 29, 1992

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To: The Commission

REPLY COMMENTS OF MINILEC SERVICE, INC.

MINILEC SERVICE, INC. ("Minilec") hereby submits its reply comments to the Federal Communications Commission in response to the "Formal Opposition of Mobile Telecommunication Technologies Corporation" filed on June 19, 1992, and in support of the request of Paging Network, Inc. for a pioneer's preference for its proposed VoiceNow service. As its reply comments, Minilec respectfully states:

Background

In a petition filed on June 1, 1992, Paging Network, Inc. ("PageNet") seeks a pioneer's preference for a new voice paging service in the 930 - 931 MHz band, which it has denominated "VoiceNow" service. Mobile Telecommunication Technologies Corporation ("Mtel") opposed the request in a lengthy pleading filed on June 19, 1992, arguing broadly

that PageNet did not adequately demonstrate the technical feasibility of its proposed system concept for VoiceNow. Mtel also questioned PageNet's study showing a substantial public demand for voice paging service of the quality proposed by PageNet.

Minilec is the industry's leading third party service company, specializing in the high volume, wholesale maintenance of paging receivers. Its clients include literally all of the major paging carriers as well as many of the industry's leading manufacturers. Of more importance here, Minilec also provides research and development services for its manufacturing clients, as well as investigating new product concepts on its own accord. Its staff has received several U.S. patents in the field of voice messaging.

Minilec believes it has substantial information and expertise relevant to the issues raised by Mtel which the Commission should have the benefit of in order to make an informed decision in this proceeding. Minilec's information and experience contradicts Mtel's arguments and supports PageNet's VoiceNow proposal and its companion request for a pioneer's preference.

Demand for Voice Paging Service

Mtel has alleged that "declining marketplace demand for conventional voice paging services suggests little consumer interest in VoiceNow's core purpose" (p. 4). Minilec's

experience in this area leads it to quite the contrary conclusion. At the 1987 Telocator convention in San Francisco, Minilec unveiled prototypes for a new product (called "Ready Talker") which, in retrospect, was very much a precursor to PageNet's VoiceNow proposal.¹ Minilec's "Ready Talker" concept was to repackage voice paging as high capacity, portable voice messaging. ("The telephone answering machine in your pocket.") Voice storage was installed in the pager itself, providing for the playback of multiple, variable length messages at the user's convenience. More important, analog time compression yielded a four-fold improvement in subscriber loading capacity over conventional voice paging systems. Industry response to Minilec's Ready Talker concept was overwhelmingly positive.

Despite this preliminary marketplace acceptance of Minilec's portable voice mail concept, the existing industry infrastructure was such that Minilec was unable to bring Ready Talker to fruition. While voice paging remained popular with the consumer in small markets and as a niche item in a limited number of larger markets, the carriers had for the most part already abandoned voice paging. Revenues necessary to support extensive, wide area systems would have

¹ Minilec first described its product concept to the Commission in comments dated March 4, 1991 in RM-7617, Telocator's petition to allocate the 930 - 931 MHz band for Advanced Messaging Service. Minilec incorporates by reference its earlier comments and specifically reaffirms the matters stated therein.

been inconsistent with a comparatively low number of voice customers, given the limitations upon voice paging technology available until that time.

By 1987 the industry had already transitioned to a predominantly data medium, with a de facto standard emerging via POCSAG numeric or alphanumeric services. Though technically not incompatible, interleaving of voice and POCSAG paging on the same channel would be counterproductive in terms of spectral efficiency. Minilec's analog voice compression yielded a 400% improvement in efficiency over any pre-existing voice product, yet this was still deemed insufficient to overcome the problems associated with mixing formats on any given channel.

In short, despite overwhelming indications of popular demand for Ready Talker, there was not a suitable industry vehicle by which the Ready Talker concept could be brought to the marketplace as a viable public service. PageNet's proposal solves that problem and should be rewarded by the Commission. Stated somewhat differently, the basic problem is not a lack of public demand for high quality voice paging service, as suggested by Mtel. Rather, the problem is the lack of a suitable industry vehicle for meeting that public demand. The Commission has the opportunity to foster that vehicle in the 930 - 931 MHz band and it clearly is in the public interest to do so.

In this regard, Minilec believes the situation here is highly analogous to the state of mobile telephone service prior to the advent of commercial cellular service. The Commission undoubtedly will recall that several prominent members of the land mobile community were outspoken in their skepticism of AT&T's projections of public demand for commercial cellular service, based on the level of demand for the then existing service. AT&T argued, however, that one could not properly gauge the demand for a new, high quality service on the basis of the existing service.

Quite clearly, AT&T was correct. So, here, Minilec believes it is quite invalid to try to gauge public demand for a quality voice paging service like VoiceNow by reference to existing voice paging services.

Evidence of a substantial public demand also can be found in the existing industry and regulatory focus on so-called "personal communications services" (PCS). The proponents of these services obviously recognize that voice remains man's preferred mode of communications, and they argue that there is a vast, pent-up consumer demand for low end wireless communications service costing substantially less than existing cellular service. A quality voice service like VoiceNow, with its inherent acknowledgement capability, would be able to meet a substantial portion of this demand, and supports Minilec's conclusion that there is a substantial public demand for PageNet's proposed service.

Technical Feasibility

Mtel also has asserted that "the absence of ... field tests verifying the VoiceNow system is a glaring and fatal deficiency" in PageNet's proposal (p. 3) and, further, that "to apply a cell-based re-use scheme to voice messaging ... has numerous potential fatal flaws" (p. 26).² Minilec has itself demonstrated the feasibility of PageNet's basic proposal in extensive field tests which are described in the appendix to these comments. Therefore, Mtel's objections in this regard are not well taken.

Minilec is also constrained to point out that Mtel is arguing for entirely too stringent a standard for grant of a pioneer's preference by the Commission. Mtel seems to be arguing that unless an innovation is recognized in a patent granted (or applied for) by the person seeking a pioneer's preference, no such preference can be awarded.

Minilec submits that this position is unrealistic and unwarranted. As Minilec's experience with Ready Talker vividly demonstrates, the entity which does the research and development for a patent is not necessarily the entity which is able to bring the underlying service to the public.

² In fact, Mtel also argues at some length that PageNet's system concept does not contain any innovations which Mtel deems "worthy of a pioneer's preference". It appears to Minilec that there is a fundamental inconsistency in arguing, on the one hand, that technical feasibility has not adequately been demonstrated while, at the same time, arguing that there is nothing new or innovative about PageNet's proposal.

Instead, it may be necessary for an entity experienced in providing service to build upon the basic innovation in order to create a suitable infrastructure for delivery of the service to the public. That form of innovation is equally important and should similarly be rewarded with a pioneer's preference. By contrast, if Mtel's argument is taken to its logical conclusion, it is difficult to see how anyone but an established equipment manufacturer with the resources both to manufacture equipment and build service networks could ever get a pioneer's preference. Minilec does not believe the preference concept should be so limited under the Commission's rules.

Finally, Minilec would like to respond to Mtel's criticism that some of PageNet's proposed technology in its VoiceNow service (e.g., 16 QAM digital modulation) may not be practical. Mtel may well be correct that some of the techniques proposed by PageNet will not ultimately prove out, but the Commission should not become immersed in this type of minutia. Instead, the Commission should satisfy itself that the basic system concept is feasible; and it should promulgate certain minimum regulations to insure efficient use of the spectrum while affording licensees substantial flexibility in precisely how the particular

results are achieved consistent with the prescribed efficiency standard.³

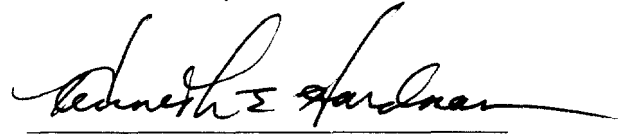
Conclusion

Minilec's extensive experience confirms both the public need for and feasibility of PageNet's basic proposal in this proceeding for implementation of a high quality, high capacity voice paging service. Minilec therefore believes that the proposal should be implemented by the Commission, and that the requested pioneer's preference should be granted.

Respectfully submitted,

MINILEC SERVICE, INC.

By:



Martin A. Schwartz
President
Richard J. Helferich
Vice President
MINILEC SERVICE, INC.
9321 Eton Avenue
Chatsworth, CA 91311

Kenneth E. Hardman, P.C.
Attorney At Law
1255 - 23rd Street, N.W.
Suite 800
Washington, D.C. 20037
Telephone: (202) 223-3772

Its Attorney

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³ For example, the Commission should establish a minimum efficiency standard of at least a factor of two in order to insure adequate messaging throughput. That is, transmission channel time required for a particular message should be half or less of the real time required for the spoken message. Other standards could establish minimum frequency reuse criteria (see Figure 2), standards for message delivery attempts and standard for measuring voice channel quality prior to attempting a message transmission (see EIA/ITA-15-54-A).

A. Technical Feasibility of a Real-World Voice Paging System Having Features and Methodology of the Type Referred to By Paging Network, Inc., as "VoiceNow"

Minilec Service, Inc. has conducted "real-world" tests in six U.S. cities including Los Angeles, California Involving a cellular voice paging system which utilizes frequency reuse and voice compression technology for the purpose of achieving spectral efficiency. The system additionally utilizes a digital voice storage paging transceiver having two minutes of the voice storage capacity and digitally signaled answer back capabilities.

Cell configuration (i.e. N=4, N=7) in the test cities varied depending on terrain, signal propagation, coverage area, etc. Each system in the test cities included a simulcast paging channel, a system answer back receive channel and multiple voice message transmit channels per cell. In order to guarantee radio-link continuity between a designated cell's voice channel and pager transceiver, a Clear Channel Signal (CCS) was transmitted on the designated voice channel allocated to the targeted pager transceiver. Upon verification of the designated voice channel, a compressed voice message was transmitted via the voice channel to the targeted pager transceiver.

Upon receipt by the pager, the compressed voice message was automatically recorded in digital format for replay at

some chosen time by the pager user. After receipt of the voice message, the paging transceiver transmitted a short burst acknowledgement signal to the system receiver, which acknowledged receipt of the message and terminated communication. When acknowledgement was not received, the system would perform a retry routine at specified intervals.

B. Basic Operation and Features of Test System

When a message is to be sent, the cellular places a call to the pager user. A personal greeting is played, which was previously recorded in the pagers user's own voice (stored at the message terminal) and a pleasant tone indicates that the caller may begin recording his message. Just like a telephone answering machine, the caller speaks into the phone leaving whatever message he/she would like to send to the pager user. When the caller has completed the message, the system instructs the caller to, "Press one for message delivery confirmation or you may hang up now. Your message will be delivered shortly. Thank you for calling."

Should the caller press one, three additional choices are given. The caller is instructed to press one to have the system return a call to the caller in order to confirm message delivery. The caller is prompted by the system to enter his/her phone number and agree to pay for the confirmation call. The caller may press two for a Toll free number. This number may be called by the caller in order to

obtain conformation, in which case, the caller is given a message ID number. The caller may press three for emergency delivery (via special access code) in which case the caller stays on the line and verbal conformation is given to the caller in real time via system voice prompts upon delivery. After completion by the caller the system network signals the pager on a wide area simulcast system similar to that shown on Figure 1.

The pager upon receiving a page, sends an acknowledgement on a different channel which is delivered, through network receivers, to the network controller. Based upon location, signal strength, S/N, etc., the controller deflects the optimum cell site and voice channel for delivery of the message and sends an assignment command to the pager. Responsive to the assignment command, the pager selects the frequency assigned and verifies improper cell allocation and channel continuity by analyzing a clear channel signal (CCS) having a color code assignment consistent with EIA/TIA-IS-65 specifications.

After a clear message channel is established between the specified pager and designated cell, the system then, utilizing voice compression techniques and having already established a clear message path with the pager, broadcasts the voice message over the single transmitter. Meanwhile, that channel frequency is reused by other cells in the same metropolitan area to transmit different voice messages.

Should the pager be turned off, not located, or receive errors, the system periodically performs retries on a secondary basis in order to conserve airtime. After the message is received and stored by the pager, the user is automatically alerted to the presence of the message. He/she is then free to listen to the message, save the message, scroll through other messages, and delete messages, all at the user's discretion. After the message is delivered, the system informs the caller that the message was delivered and the date and time of delivery. Optionally, the system informs the caller that the message was not delivered by a specific time or day.

C. Verification of Technology

Frequency Reuse - Minilec Service, Inc. has confirmed that the methodology proposed by Paging Network, Inc. involving frequency reuse in a cellular paging system is feasible utilizing today's technology.

Voice Compression - Minilec Service, Inc. has confirmed that the methodology proposed by PageNet involving voice compression in a cellular paging system is feasible. Utilizing today's technology, time compression ratios of 3:1 were achieved (i.e. 15 second message compressed to 5 seconds) while maintaining modulation mask requirements. Higher compression rates utilizing digital modulation is theoretically possible.

Dynamic Channel Reallocation - Minilec Service, Inc. did not test the methodology proposed by PageNet involving dynamic channel reallocation, therefore it cannot confirm or deny the performance of such an arrangement. Minilec Service, Inc. is however, aware of similar reallocation schemes utilized by cellular telephone carriers in areas of fluctuating traffic conditions. Minilec believes that the concept of dynamic channel allocation is technically feasible based on current technology.

CELLULAR VOICE PAGING SYSTEM

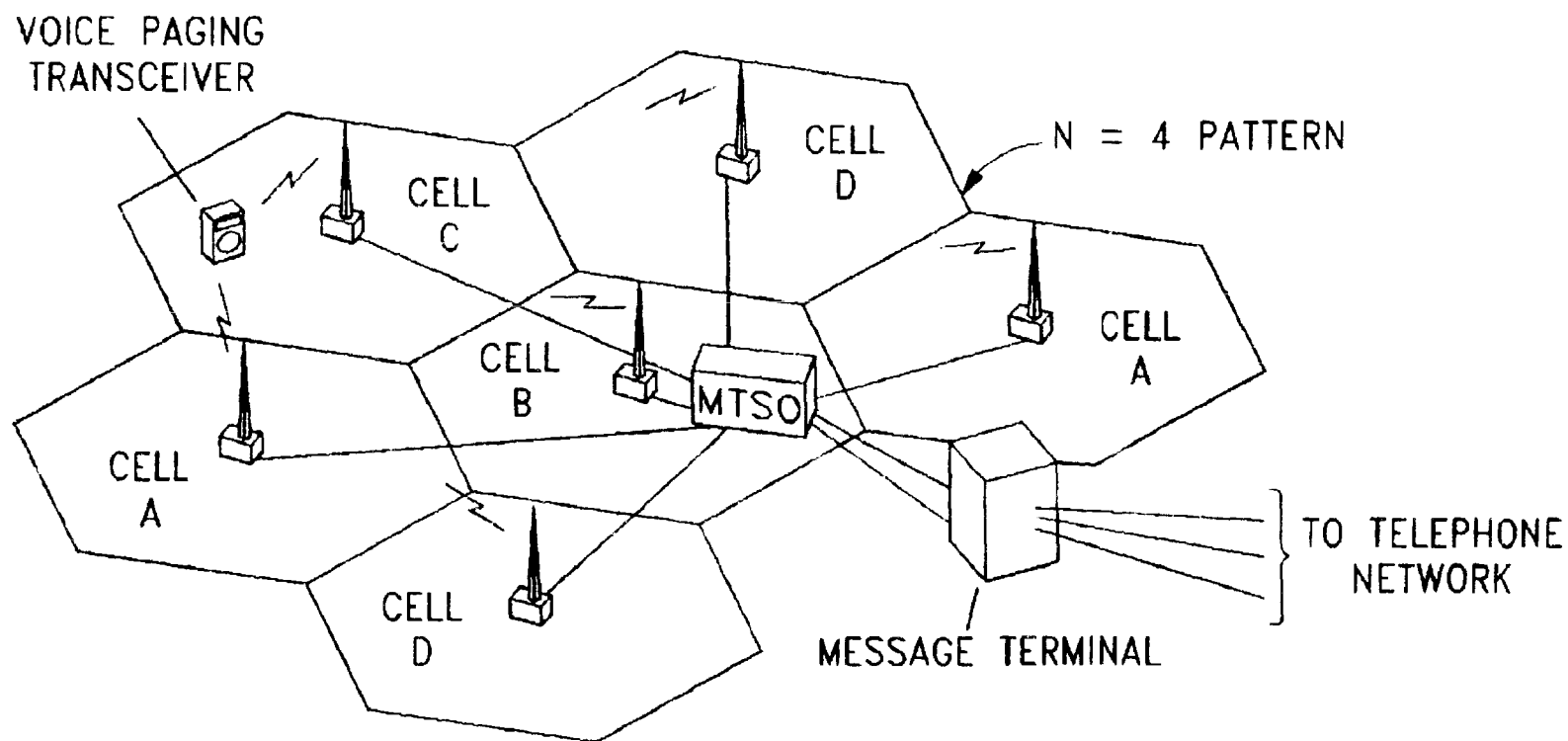


FIG. 1

Drawing by Minilec Service Inc.

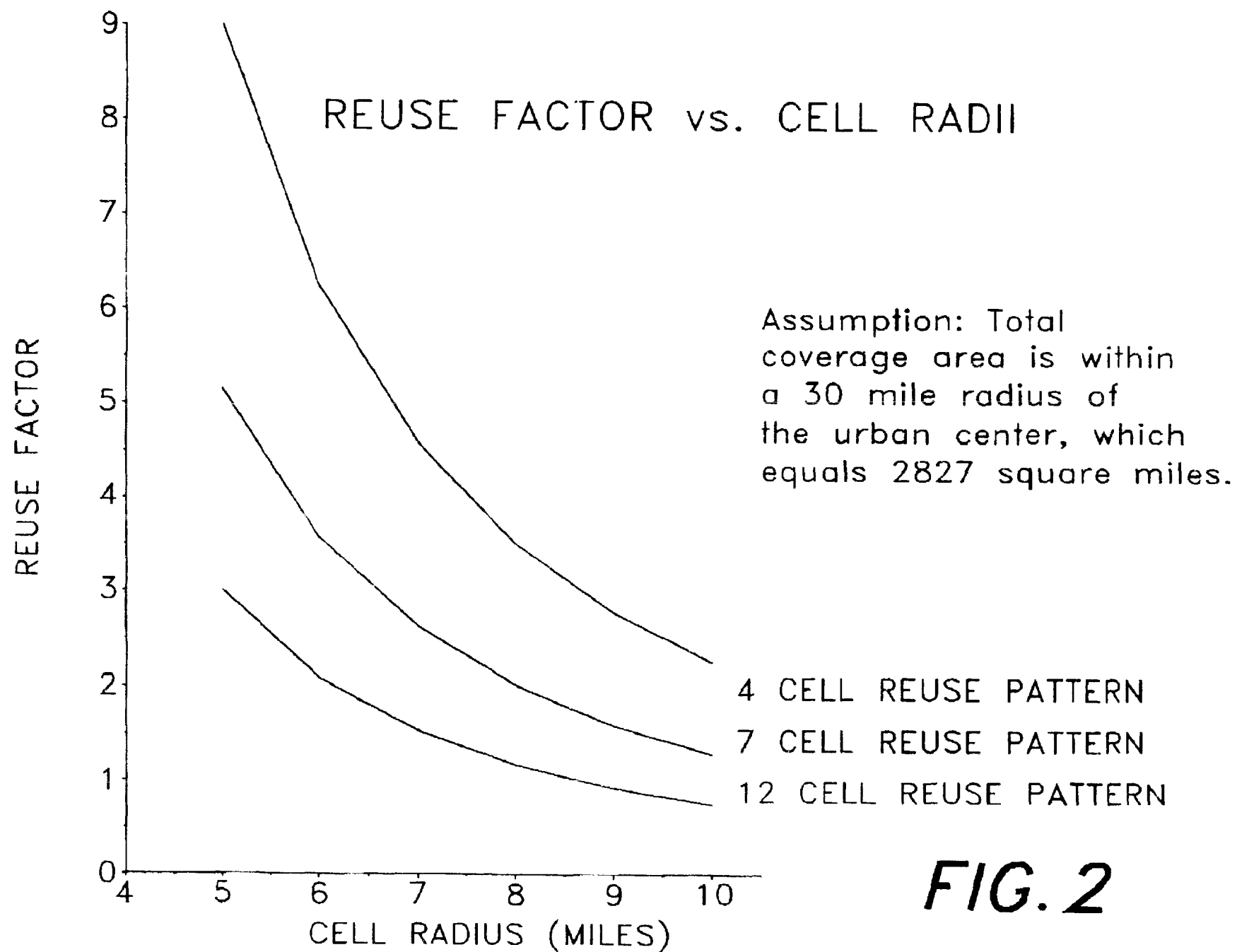


FIG. 2

CERTIFICATE OF SERVICE

I hereby certify that I have this 29th day of June, 1992, served the foregoing Reply Comments of Minilec Service, Inc. upon Paging Network, Inc. and all parties of record commenting on its request for a pioneer's preference by mailing a true copy, first class postage prepaid, to the counsel for such parties as shown on the following list:

Judith St. Ledger-Roty
REED SMITH SHAW & McCLAY
1200 - 18th Street, N.W.
Washington, D.C. 20036

Gerald S. McGowan
LUKAS, MCGOWAN, NACE
& GUTIERREZ, CHARTERED
1819 H Street, N.W.
7th Floor
Washington, D.C. 20006

R. Michael Senkowski
WILEY, REIN & FIELDING
1776 K Street, N.W.
Washington, D.C. 20006

Jeffrey Blumenfeld
BLUMENFELD & COHEN
1615 M Street, N.W.
Suite 700
Washington, D.C. 20036



Kenneth E. Hardman